Amendments to the Drawings:

Applicant is providing herewith two (2) replacement sheets for sheets 1/3 and 2/3, filed with the application. The Amendments to the drawings are supported by the specification of the instant application, and are described in detail, in the body of the present response, as required by 37 C.F.R. § 1.121(d). Additionally, two annotated sheets, showing changes made, are included herewith.

Attachment: two (2) Replacement Sheets

two (2) Annotated Sheets Showing Changes

Remarks:

Applicant appreciatively acknowledges the Examiner's confirmation of receipt of Applicant's claim for priority and certified priority document under 35 U.S.C. § 119(a)-(d).

Reconsideration of the application, as amended herein, is respectfully requested.

Claims 1 - 20 are presently pending in the application. Claims 1, 2, 10 and 11 have been amended.

In item 2 of the above-identified Office Action, it was noted that certain references on pages 4 and 5 of the previously submitted information disclosure statement were "lined out", since the references were in a foreign language. Applicant reserves the right to submit, under separate cover, at least one of an English language abstract, translation, equivalent reference, statement of relevance, etc., for the "lined out" references.

In item 3 of the Office Action, the drawings were objected to because Figure 1 including an extra "(" in the equations for f_1 - f_3. Applicant has amended Fig. 1 to delete the extra "(" from those equations. Thus, the instant Fig. 1 is believed to address the objection to Fig. 1 in item 3 of the Office

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Action. However, Applicant has additionally amended Fig. 1 to
include the derivatives $\dot{x}_1(t)$, $\dot{x}_2(t)$, $\dot{x}_3(t)$ (c.f. p. 6, l.1.,
"derivatives $\underline{\dot{x}}(t),...,\underline{x}^{(k)}$" of the application). This further
amendment to Fig. 1 is supported by the specification of the
instant application, for example, on page 20 of the instant
application, which shows the now amended format of the
equations and references it to Fig. 1.

Additionally, Applicant has amended Fig. 4, herein, to show a
new dependence matrix $\underline{A}$. The amendment to Fig. 4 is supported
by the specification of the instant application, fore example
on page 25 of the instant application, lines 4 - 15, in which
the dependence matrix of the amended Fig. 4 is described. As
such, the new dependence matrix $\underline{A}$ of the amended Fig. 4
conforms that figure with the description in the
specification.

Additionally, it was noted that there were two figures of the
instant application labeled as "Fig. 4" and no figure labeled
as "Fig. 5". As such, Applicant has relabeled the "second
Fig. 4" as Fig. 5. This amendment is supported by the
specification of the instant application, for example on page
26 of the instant application, lines 12 - 13, which states:

> The error information specified in FIG. 5 is output in
> step 3.

As such, the amendment to "second Fig. 4", relabeling it as "Fig. 5" of the instant application, conforms the figures of the instant application to the originally filed specification.

Applicant is including herewith, two replacement sheets including Figs. 1 - 5, as well as two annotated sheets, showing the changes made to Figs. 1, 4 and 5.

In item 5 of the Office Action, claims 1 - 20 were rejected as allegedly being indefinite under 35 U.S.C. § 112, second paragraph. More particularly, it was alleged in item 6 of the Office Action that the term "and including", recited in Applicant's claim 1, made that claim unclear. Applicant has amended claim 1 to address the concern raised in item 5 of the Office Action.

Additionally, item 7 of the Office Action alleged that claim 1 was unclear whether the use of "m" in that claim was with regard to the same number or different numbers. Applicant has amended claim 1 to replace "m elements" with "m number of elements" to illustrate that "m" is a quantity.

Further, item 8 of the Office Action alleged that claim 1 was unclear because of a hanging "," at the end of the equation for f_i. Applicant has amended claim 1 to delete the hanging

comma in the equation for f_i, and thus address the concern

raised in item 8 of the Office Action.

Item 9 of the Office Action alleged that claim 1 was unclear

because of the phrase "an ith row of $\underline{f}$". Applicant has amended

claim 1 to replace "$\underline{f}$" with "$\underline{f}(t,\underline{x}(t), \underline{\dot{x}}(t),...,\underline{x}^{(k)}(t),\underline{p})$", in

order to address the concern raised in item 9 of the Office

Action. This amendment is supported by the specification of

the instant application, for example, on page 8, line 6 of the

instant application.

Item 10 of the Office Action alleged that claim 1 was unclear

because of the recited limitation "$\underline{\underline{A}}(i,j)$", where A was twice

underlined. Applicant has amended claim 1 in an effort to

clarify that $\underline{A}(i,j)$ is really "$\underline{A}(i,j)$ once underlined

(although, such is difficult to show, since additions to

claims are underlined, so adding a single underlined "A" to a

claim is represented by a double underline). It is believed

that the above amendment addresses the concern raised in item

10 of the Office Action.

Item 11 of the Office Action alleged that claim 1 was unclear

because of lacking proper antecedent basis for "the numbers of

those rows". Applicant has amended claim 1 to address the

concern raised in item 11 of the Office Action.

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Item 12 of the Office Action alleged that claim 1 was unclear because of lacking proper antecedent basis for "the numbers of those columns". Applicant has amended claim 1 to address the concern raised in item 12 of the Office Action.

Item 13 of the Office Action alleged that claim 2 was unclear because of the limitation "length n". Applicant has amended claim 2 to clarify that "n" is a number. As such, it is believed that Applicant has addressed the concern raised in item 13 of the Office Action.

Item 14 of the Office Action alleged that claim 2 was unclear because of the limitation "length m". Applicant has amended claim 2 to address the concern raised in item 14 of the Office Action.

In item 15 of the Office Action, the preamble of claim 10 was rejected as allegedly being unclear as to whether a computer program produce or method was being claimed. Applicant has amended the preamble of claim 10 to address the concern raised in item 15 of the Office Action.

In item 16 of the Office Action, claim 10 was rejected because it was allegedly unclear whether the "product" was a certain

form, or whether a system of equations was in the recited

form. Applicant has amended claim 10 to address the concern

raised in item 16 of the Office Action.

Additionally, item 17 of the Office Action alleged that claim

10 was unclear whether the use of "m" in that claim was with

regard to the same number or different numbers. Applicant has

amended claim 10 to replace "m elements" with "m number of

elements" to illustrate that "m" is a quantity.

Item 18 of the Office Action alleged that claim 10 was unclear

because of lacking proper antecedent basis for "the numbers of

those rows". Applicant has amended claim 10 to address the

concern raised in item 19 of the Office Action.

Item 19 of the Office Action alleged that claim 10 was unclear

because of lacking proper antecedent basis for "the numbers of

those columns". Applicant has amended claim 1 to address the

concern raised in item 19 of the Office Action.

Item 20 of the Office Action alleged that claim 11 was unclear

because of the limitation "length n". Applicant has amended

claim 11 to clarify that "n" is a number. As such, it is

believed that Applicant has addressed the concern raised in

item 20 of the Office Action.

Item 21 of the Office Action alleged that claim 11 was unclear because of the limitation "length m". Applicant has amended claim 11 to address the concern raised in item 21 of the Office Action.

Further, item 22 of the Office Action alleged that claim 1 was unclear because of a hanging "," at the end of the equation for f_i. Applicant has amended claim 1 to delete the hanging comma in the equation for f_i, and thus address the concern raised in item 22 of the Office Action.

Item 23 of the Office Action alleged that claim 10 was unclear because of the phrase "an ith row of $\underline{f}$". Applicant has amended claim 1 to replace "$\underline{f}$" with "$\underline{f}(t,\underline{x}(t), \underline{\dot{x}}(t),...,\underline{x}^{(k)}(t),\underline{p})$", in order to address the concern raised in item 23 of the Office Action. This amendment is supported by the specification of the instant application, for example, on page 8, line 6 of the instant application.

It is accordingly believed that the claims meet the requirements of 35 U.S.C. § 112, second paragraph.

Further, in item 25 of the Office Action, claims 1 - 20 were rejected under 35 U.S.C. § 101, as allegedly being directed to

non-statutory subject matter. Applicant respectfully

traverses this rejection.

Claims 1 and 10 were rejected in item 26 of the Office Action,

as allegedly being directed a recitation of abstract ideas.

Applicant respectfully disagrees. More specifically, the

instant application, and particularly the embodiment of FIG. 6

- 8 show a system of equations **of an electrical network** (see,

for example, page 28 of the instant application, lines 1 - 3).

In Applicants' **claimed** invention **error information is**

outputted (see "step 3" of Applicant's claims 1 and 10,

reciting, among other things "outputting error information").

A person of ordinary skill in this art would understand

Applicant's claimed **"outputting"** of the **"error information"**

(i.e., the **final product** of the execution of the system of

equations in Applicant's claims) to be to a printer, computer

or memory storage in the context of the computer system

recited in the Applicant's claims 1 and 10. This

understanding is further supported by the specification of the

instant application, for example, on page 16, lines 16 - 23,

which state:

> Owing to this refinement of the method according to
> the invention, significance contents that refer
> directly to the technical system to be simulated are
> output as error information. **This error information**
> **can be used** to illustrate with particular ease,
> **systematic errors in the structure of the system of**
> **differential equations for describing the technical**

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system, such that locating the errors is further accelerated. [emphasis added by Applicant]

As such, it can be seen that the resultant **error information** of Applicant's claims **is physically and tangibly output**, so as to be used to illustrate systematic errors in the structure of the system. This can be further seen, for example, on page 26, lines 15 - 22, which state:

> In accordance with the invention, there is not even an attempt to predict the behavior of the basic system using numerical means, because in this case errors will occur if a simulation is at all possible. However, the modeling of the system and the system itself need to be checked once again. This saves valuable computing time on the computer system (not shown here). **Error locating is substantially simplified <u>by the knowledge of the error information output in step 3</u>.** [emphasis added by Applicant]

See also, page 30 of the instant application, line 22 - page 31, line 3. **Clearly, the error information is outputted from Applicant's claimed invention <u>in a useful, tangible and concrete form</u>. The <u>outputting</u> of the <u>error information</u> is a limitation of Applicant's claims 1 and 10.** As such, Applicant's claims 1 and 10 are believed to be statutory subject matter under 35 U.S.C. § 101.

Further, in item 27 of the Office Action, Applicant's claims 3, 4, 8 10 and 11 were rejected as allegedly relating to a computer program listing the expression of the ideas, but without defining structural or functional interrelationships.

Applicant notes that claims 10 and 11 have been amended to clarify that the equations are solved with the method of a computer or an analog computer. Further, Applicant's claims 3, 4 and 8 incorporate all of the limitations of Applicant's claim 1. Applicant's claim 1 recites, among other limitations, "providing a computer system". Thus, Applicant's claims 3, 4 and 8 additionally recite that a computer system is provided for performing the method. As such, it is believed that the required structure is, indeed, recited and defined in Applicant's claims 3, 4, 8, 10 and 11. Applicant's claims 3, 4, 8, 10 and 11 are, thus, believed to be statutory under 35 U.S.C. § 101.

Further, in item 28 of the Office Action, claims 7 and 12 - 15 were rejected as allegedly reciting "the physical characteristics of a form of energy". Applicant respectfully disagrees. Applicant's claim 7 recites, among other things, all of the limitations of Applicant's claim 1, which includes the step of "providing a computer system". Applicant's claims 12 - 15 recite, among other things, recite all of the limitations of Applicant's claim 10, which requires the methods to be solved with the aid of a computer or an analog computer. As such, claims 7 and 12 - 15 **actually require and recite**, among other things, **a physical computer for executing the systems of equations**. Applicant respectfully disagrees that the recitation of the instructions being stored on a

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computer readable medium or a computer program product **negates the prior recitation of a computer**, made in claims 1 and 10, and incorporated into claims 7 and 12 - 15. As such, Applicant's claims 7 and 12 - 15 are additionally believed to be statutory subject matter under 35 U.S.C. § 101.

In item 30 of the Office Action, claims 1, 3, 5, 7, 10, 12, 14, 16 and 18 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Unger et al., "Structural Analysis of Differential-Algebraic Equation Systems-Theory and Applications", Computers Chem. Engng., Vol. 19, No. 8, pp. 867 - 882, 1995 ("**UNGER**"). In item 33 of the Office Action, claims 8, 9, 19 and 20 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over **UNGER** in view of U. S. Patent No. 6,266,630 to Garcia-Sabiro et al ("**GARCIA**").

Applicant respectfully traverses the above rejections.

More particularly, Applicant's claim 1 recites, among other limitations:

> step 1: setting up a dependence matrix $\underline{A}$ with m number of columns and n number of rows, and setting an element $\underline{A}$ to $\underline{A}(i,j) \neq 0$ when an ith row of
> $$\underline{f}\left(t, \underline{x}(t), \underline{\dot{x}}(t), \ldots, \underline{x}^{(k)}(t), p\right) \text{ defined with } \underline{f}_i\left(t, \underline{x}(t), \underline{\dot{x}}(t), \ldots, \underline{x}^{(k)}(t)\right) [[\tau]])$$
> is a function of
>
> a) a jth element of $\underline{x}$ expressed as $\underline{x}_j(t)$; or

b) one of the derivatives of the jth element of $\underline{x}$ defined as $\underline{x}_j^{(s)}(t)$;

and otherwise setting the element $\underline{A}(i,j)=0$;

Applicant's amended claim 10 recites a similar limitation.

However, contrary to Applicant's claimed invention, the **UNGER** reference fails to teach or suggest, among other limitations of Applicant's claims, setting up a dependence matrix $\underline{A}$ as described in step 1 of claim 1 of the application. More particularly, the dependence matrix $\underline{A}$ of the present application is different from the ODE system of multiple ODEs disclosed in **UNGER**. For example, there is a clear rule defined in Applicant's claims, that states which element of the dependence matrix $\underline{A}$ takes which value in step 1 of claims 1 and 10. The corresponding steps 2 and 3 of **UNGER** (Fig. 1 on page 871 of **UNGER**) are clearly different from Applicant's claimed steps.

This difference between **UNGER** and Applicant's claimed invention can be demonstrated, for example, by equation (26) of **UNGER**, on page 875 of **UNGER**. In equation (26) of UNGER, the four DAEs of this example are given in equations (2) – (5). **As shown, the method of UNGER delivers a set of two square matrices.** Applicant's claimed invention generates a single matrix which is not necessarily limited to being

square. As such, Applicant's claimed invention is believed to be patentable over **UNGER**.

Further, Applicant's claim 1 has been amended to recite, among other limitations, a further definition of the row ranks and column ranks. More particularly, Applicant's claim 1 has been amended to recite, among other limitations:

> wherein the row rank includes a set C_2 of natural numbers i, where $1 \leq i \leq n$, of the matrix $\underline{A}$ with the n number of rows and the m number of columns when it fulfils the conditions of:
>
> i) no transversal T of the matrix $\underline{A}$ such that C_2 is contained in the set of row indices of T, and
>
> ii) for each element c of C_2 there is a transversal T of the matrix $\underline{A}$ such that $C_2 \setminus \{c\}$ is wholly contained in the set of the row indices of T,
> and
>
> the column rank comprises a set C_3 of natural numbers i, where $1 \leq i \leq m$, of the matrix $\underline{A}$ with the n number of rows and the m number of columns when it fulfils the conditions of:
>
> i) no transversal T of the matrix $\underline{A}$ such that C_3 is contained in the set of row indices of T, and
>
> ii) for each element c of C_3 there is a transversal T of the matrix $\underline{A}$ such that $C_3 \setminus \{c\}$ is wholly contained in the set of the column indices of T.

Applicant's independent claim 10 has been amended to recite a similar limitation, among others.

These amendments to claim 1 and 10 of the instant application are supported by the specification of the instant application,

for example, on page 10 of the instant application, lines 4 -
13 and page 11, line 20 - page 12, line 3.

The **UNGER** reference neither teaches, nor suggests, among other
limitations of Applicant's claims, Applicant's particularly
claimed way of determining row ranks and column ranks. More
particularly, Applicant's claimed steps for determining aset
of "row ranks" and a set of "column ranks" are different from
UNGER's step of determining a "structural rank".

For example, **UNGER** is choosing a different way, quantifying an
index v_d of the DAE system. See, for example, page 867 of
UNGER, last paragraph of the left-side column. **UNGER** is,
therefore, using an algorithm that transforms the DAEs into an
ODE system of multiple ODEs. This can be seen from page 871
of **UNGER**, left-hand column, second to last paragraph,
Definition 2.1. See also, steps 2 and 3 of Fig. 1 of **UNGER**,
also on page 871 of **UNGER**. **UNGER** emphasizes, on page 871,
right-hand column, the last paragraph, that the aforementioned
steps are difficult, in practice. As such, **UNGER** discloses
introducing a "structural representation" of the
aforementioned algorithm, including the definition of a so-
called "structural rank" of a matrix. See, for example,
UNGER, page 872, left-hand column, "Definition 3.3". The
"structural rank" of **UNGER** is defined more precisely in

equation (24), on page 873 of **UNGER**. The approach of **UNGER** -

if brought into practice - leads towards an index analysis, as

mentioned in the last paragraph of example 4.2 on pages 876 -

878 of **UNGER**.

As such, among other limitations of Applicant's claims, **UNGER**

fails to teach or suggest the particularly defined sets of row

ranks and column ranks of Applicant's amended claims.

Further still, a person of ordinary skill in the art, reading

UNGER, would not be led to combine **UNGER** with known

definitions that would achieve Applicant's particularly

claimed determination of a set of "row ranks" and a set of

"column ranks".

In fact, **UNGER** teaches away from Applicant's claimed

invention. In particular, **UNGER** does not merely calculate a

dependence matrix, but he also says explicitly how one would

calculate the "structural rank" that he is using in his

method. **UNGER** even gives an explicit, step-by-step example

for performing his method. A person of ordinary skill in the

art, starting from **UNGER**'s sample matrix according to steps 2

and 3, would **not** look for a set of "row ranks" and a set of

"column ranks" elsewhere (i.e., determined by another method),

since **UNGER**'s disclosed method explicitly teaches calculating

the "structural rank". If motivated by the teachings of
UNGER, at all, a person of skill in this art would consider
calculating the "**numerical rank**" of UNGER's **sample matrix**, as
mentioned on page 872 of **UNGER**, the third to last paragraph.

Applicant respectfully submits that, combining rather
complicated scientific papers which may appear to be similar
because the words "matrix" and "rank" are used in both, would
not produce Applicant's claimed invention. Rather, if one
takes a deeper look into the documents it comes out that they
are, in fact, different. Mathematical steps of a numerical
method, such as shown in **UNGER**, cannot just be arbitrarily
replaced with steps of other mathematical methods.

Applicant respectfully submits that, even if one combines the
disclosure in **UNGER** of setting up the sample matrix according
to steps 2 and 3 of **UNGER**, with the steps of calculating its
sets of "row ranks" and "column ranks", the result obtained
would not be a meaningful result. Instead, such a combination
would provide a numerical result with no meaning at all.
Thus, a person of skill in this art would not receive any
insight or direction towards Applicant's claimed invention, by
considering **UNGER**, in the manner set forth in the Office
Action.

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As such, Applicant's amended claims 1 and 10 are believed to be patentable over the **UNGER** reference. The **GARCIA** reference, cited in the Office Action in combination with **UNGER** against certain of Applicant's dependent claims, does not cure the above-discussed deficiencies of the **UNGER** reference.

It is accordingly believed that none of the references, whether taken alone or in any combination, teach or suggest the features of claims 1 and 10. Claims 1 and 10 are, therefore, believed to be patentable over the art. The dependent claims are believed to be patentable as well because they all are ultimately dependent on claims 1 and 10.

In view of the foregoing, reconsideration and allowance of claims 1 - 20 are solicited.

In the event the Examiner should still find any of the claims to be unpatentable, counsel would appreciate receiving a telephone call so that, if possible, patentable language can be worked out.
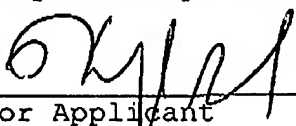
Additionally, please consider the present as a petition for a two (2) month extension of time, and please provide a two (2) month extension of time, to and including, May 7, 2007, to respond to the present Office Action.

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The extension fee for response within a period of two (2) months pursuant to Section 1.136(a) in the amount of $450.00 in accordance with Section 1.17 is enclosed herewith.

Please provide any additional extensions of time that may be necessary and charge any other fees that might be due with respect to Sections 1.16 and 1.17 to the Deposit Account of Lerner Greenberg Stemer LLP, No. 12-1099.

Respectfully submitted,

_____
For Applicant

May 7, 2007

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